

REMARKSI. Status of the Application

Claims 1-20 are pending in this application. In the March 12, 2003 Office Action, the Examiner:

- A. Rejected claims 1, 2, 8 and 10 under 35 U.S.C. § 102(b) as allegedly being anticipated by U.S. Patent No. 4,311,671 to Notman;
- B. Rejected claims 3-6 under 35 U.S.C. § 103(a) as allegedly being unpatentable over Notman;
- C. Rejected claims 7 and 11 under 35 U.S.C. § 103(a) as allegedly being unpatentable over U.S. Patent No. 5,137,701 to Mundt in view of Notman;
- D. Rejected claim 9 under 35 U.S.C. § 103(a) as allegedly being unpatentable over Notman in view of U.S. Patent No. 5,384,051 to McGinness; and
- E. Rejected claims 12-14 under 35 U.S.C. § 103(a) as allegedly being unpatentable over Mundt in view of Notman and McGinness.

In this response, Applicants hereby affirm the election of Group I claims 1-14.

Accordingly, Applicants have canceled claims 15-20 without prejudice. Further, Applicants have amended claim 1 and added claims 21-26. Applicants respectfully traverse the foregoing rejections and respectfully request allowance of all claims in view of the following remarks.

II. The Amendment Does Not Constitute New Matter

The amendment to claim 1 is adequately supported by the specification as filed, and therefore does not constitute new matter. The amendment is directed to limitations relating to the gas port being disposed downstream of the inlet of the passageway and upstream of the outlet of the passageway. In particular, the disclosure of such subject matter may be found in the application as filed at page 12, lines 4-14 in conjunction with Fig. 1.

III. The Prior Art Rejection of Claims 1, 2, 8 and 10 Should be Withdrawn

In the Office Action (Paper No. 2) dated March 12, 2003, the Examiner rejected claims 1, 2, 8 and 10 under 35 U.S.C. Section 102(b) as allegedly being anticipated by Notman. Applicant has amended claim 1 and respectfully submits that claim 1 is in condition for allowance.

A. The Present Invention

Claim 1 is directed to a process effluent abatement arrangement including an enclosure which defines an interior void. A first partition has a first orifice defined therein. The first partition is positioned within the interior void such that the first partition divides the interior void into a first chamber and a second chamber and the first orifice is in fluid communication with the first chamber and the second chamber. A gas connector has a passageway defined therethrough. A gas port is in fluid communication with the passageway. The passageway has an inlet and an outlet and is in direct fluid communication with the first chamber of the enclosure. A gas dispenser is in direct fluid communication with the second chamber of the

enclosure. An exit port is in fluid communication with the interior void. The amendments to claim 1 recite that the gas port is downstream of the inlet and upstream of the outlet.

B. Notman

Notman is directed to a reactor for catalytic gas reactions including at least one catalyst bed in the form exteriorly of a cylinder having a vertical axis and a height not greater than half its over-all diameter. The bed is defined on its underside by a substantially flat grid supported by a dished plate having peripheral mechanical connection to a downward extension of the cylinder walls (column 1, lines 39-46).

C. Notman Does Not Teach or Suggest a Gas Port Disposed as Claimed

Notman does not teach or suggest a gas port disposed downstream of the gas connector passageway inlet and upstream of the gas connector passageway outlet, as called for in claim 1. In particular, in applying Notman in the rejection of claim 1, the Examiner contended that the Notman spargers 30 constituted the claimed gas port, the Notman main feed 34 constituted the claimed passageway inlet and the Notman feed holes 32 constituted the claimed outlet. (See March 12, 2003 Office Action at p.4)

Notman indeed discloses that gas enters a vessel 10 through a passageway between a main feed 34 and feed holes 32. The spargers 30, however, are not disposed *upstream* of the feed holes 32. That is, the spargers 30 are not disposed *in the passageway between the main feed 34 and the feed holes 32*. Rather, the spargers 30 are disposed downstream of the feed holes 32. Thus, Notman does not disclose or suggest a gas connector which has (i) a

passageway defined therethrough and (ii) a gas port in fluid communication with the passageway, the passageway (A) having an inlet and an outlet and (B) being in direct fluid communication with a first chamber of an enclosure, the gas port being downstream of the inlet and *upstream* of the outlet, as recited in part by claim 1.

D. The Invention of Claim 1 Includes Distinct Advantages Over Notman

The advantages of the invention may be observed through review of the nonlimiting example of the claimed invention shown in Fig. 1. Because the gas port 72 of the gas connector 68 is disposed between the inlet 74 and the outlet 76 of the passageway 70 of the gas connector 68, it is possible, within the passageway 70, to mix heated gas from the gas port 72 with the etch reactor gas that enters the passageway 70 through the inlet 74. This ensures that chemical components present in the gas from the etch reactor 90 remain in the gaseous state and do not precipitate out in the passageway 70. Preventing the aforementioned chemical components from precipitating out in the passageway 70 ensures that the gas connector 68 remains open and unobstructed so that the pump 100 can continue to advance gas or effluent from the etch apparatus 90 into the enclosure 12. With the configuration of Notman, in contrast, the chemical components would precipitate out in the passageway between the main feed 34 and the feed holes 32, thereby eventually plugging up the passageway and causing the etching process to be stopped (page 14, lines 1-11 of the present specification).

E. Claim 1 is Allowable

For all of the above reasons, Applicants respectfully submit that Notman does not disclose or suggest the invention of claim 1, as amended. As a consequence, Applicants submit that claim 1 is in condition for allowance, which is hereby respectfully requested.

F. Discussion re: Patentability of Claims 2, 8 and 10

Claims 2, 8 and 10 each include claim 1 as a base claim. As a result, claims 2, 8 and 10 are allowable for the reasons hereinbefore discussed in regard to claim 1. In addition, claims 2, 8 and 10 include additional novel and nonobvious limitations. As a result, claims 2, 8 and 10 are further allowable over the cited art.

IV. The Prior Art Rejection of Claims 3-6 Should be Withdrawn

In the Office Action, the Examiner rejected claims 3-6 under 35 U.S.C. Section 103(a) as allegedly being unpatentable over Notman. However, each of claims 3-6 directly or indirectly depends from and incorporates all of the limitations of claim 1. As a result, it is respectfully submitted that the rejection of claims 3-6 should be withdrawn for at least the same reasons as those set forth above in connection with claim 1.

V. The Prior Art Rejection of Claims 7 and 11 Should be Withdrawn

The Examiner rejected claims 7 and 11 under 35 U.S.C. Section 103(a) as allegedly being unpatentable over Mundt in view of Notman. Applicants respectfully submit that claims 7 and 11 are in condition for allowance, which is hereby respectfully requested.

A. Mundt

Mundt is directed to protective apparatus that is adapted to be inserted into a gas line, for example, in a low pressure manufacturing operation. Particularly, this apparatus is constructed to help remove unwanted corrosive gases, such as chlorine and fluorine based gases, from the flow line prior to their introduction into a mechanical device such as a vacuum pump system. These unwanted corrosives may be by-product effluents or unreacted gases that are generated or employed in the manufacturing process and that could damage the mechanical integrity of the pump system or which could otherwise create hazardous situations (column 4, lines 50-62).

B. No Motivation Exists to Combine Mundt and Notman.

There is no motivation or suggestion in the references to use the catalyst beds 12A, 12B and 12C of Notman in the reaction chamber 18 of Mundt. The Examiner states that motivation is provided by the general purpose of the Mundt device, i.e., "to reduce the hazardous process chemicals from the etch reactor". This is simply a statement of the purpose of the Mundt apparatus, and does not provide any motivation to modify the Mundt apparatus in any way.

In fact, Mundt actually teaches away from the combination suggested by the Examiner. Specifically, Mundt teaches that a chemical reaction takes place between the reactant gas and the reactive element 74, and the chemical by-products are then passed through a condensation element 76. Both the reactive element 74 and the condensation element 76 are in the form of

fibrous meshes. Mundt states that the "reaction chamber 18 should be constructed in the relative proportions shown in Fig. 3; these proportions are selected to yield a 10:1 cross-section ratio where the fibrous meshes of tubes 74 and 76 are fifty percent meshes. These 'fifty percent meshes' thus have a cross-section that is fifty percent open and fifty percent closed to a gas flow, as is commonly defined in the art." (column 8, lines 4-11). The vessel 10 of Notman clearly does not contain a mesh, and, more particularly, does not contain a fifty percent mesh. Rather, a random cross section through the vessel 10 would likely have a "percent open" that is much greater than fifty percent. Only in the narrow sections of the grids 16A, 16B, 16C is the vessel 10 close to fifty percent closed.

The fiber mesh 76 of Mundt would be less expensive and more effective in trapping interacted substances than the grids 16A, 16B, 16C of Notman. As a consequence, one of ordinary skill in the art would not have any motivation to replace the fiber mesh 76 of Mundt with the more expensive and less effective grids 16A, 16B, 16C of Notman. Thus, no motivation exists for combining Mundt with Notman, as suggested by the Examiner.

For all of the above reasons, Applicants submit that Mundt and Notman are not properly combinable. Accordingly, claims 7 and 11 are patentable over the proposed combination of Mundt and Notman.

VI. The Prior Art Rejection of Claim 9 Should be Withdrawn

The Examiner rejected claim 9 under 35 U.S.C. Section 103(a) as allegedly being unpatentable over Notman in view of McGinness. Applicants respectfully submit that claim 9 is in condition for allowance, which is hereby respectfully requested.

A. McGinness

McGinness is directed to a supercritical oxidation reactor. Supercritical oxidation reactions are exploited to boost reaction rates to increase efficiency and reduce undesirable emissions. Methane or other fossil fuel gases (e.g. butane, propane) is mixed with a supercritical mix of water and an oxidizer (e.g. air or oxygen) (column 5, lines 35-42).

B. Notman and McGinness are not Properly Combinable

Applicants submit that Notman and McGinness are not properly combinable because no motivation exists to combine Notman and McGinness as proposed by the Examiner.

There is no motivation or suggestion in the references to substitute the heater 32 of McGinness for the heat exchanger 62 of Notman. The Examiner states that motivation for the substitution is to provide an alternate and equivalent means for heating. Applicants submit that the heater 32 of McGinness is not equivalent to the heat exchanger 62 of Notman, and that such a substitution would eliminate the main function of the heat exchanger 62.

More particularly, the main purpose of the heat exchanger 62 of Notman is to cool the reacted hot gas leaving the reactor 50 so that the gas can be separated into methanol and ammonia in the catchpot 70. After flowing through the heat exchanger 62, the gas is cooled further at 68 and the product is separated in the catchpot 70. Unreacted cold gas from circulator 76 is used by the heat exchanger 62 to cool the reacted hot gas from the reactor 50. That the unreacted cold gas from the circulator 76 is heated in the heat exchanger 62 during the process of cooling the hot gas from the reactor 50 is incidental. Again, the main purpose

of the heat exchanger 62 is to cool the hot gas from the circulator 76, not to heat the cold gas from the circulator 76.

Thus, one of ordinary skill in the art would not be motivated to substitute the heater 32 of McGinness for the heat exchanger 62 of Notman. Aside from the additional power consumption and expense of the heater 32, such a substitution would require additional cooling apparatus in order to cool the hot gas from the reactor 50 so that the gas can be separated into methanol and ammonia in the catchpot 70. Such additional cooling apparatus would result in greater space requirements, power consumption, and expense. Simply put, not only is the heater 32 of McGinness not equivalent to the heat exchanger 62 of Notman, it would not even be able perform the main function of the heat exchanger 62, which is to cool the hot gas from the reactor 50. For all these reasons, no motivation exists for combining Notman with McGinness, as suggested by the Examiner.

Accordingly, Applicants respectfully submit that Notman and McGinness are not properly combinable, and claim 9 is thus patentable over the proposed combination of Notman and McGinness.

VII. The Prior Art Rejection of Claims 12-14 Should be Withdrawn

The Examiner rejected claims 12-14 under 35 U.S.C. Section 103(a) as allegedly being unpatentable over Mundt in view of Notman and McGinness. Applicants respectfully submit that claims 12-14 are in condition for allowance, which is hereby respectfully requested.

A. Notman is not Properly Combinable with Either Mundt or McGinness

For the reasons discussed above in Section V, Applicants submit that Notman is not properly combinable with Mundt. Moreover, for the reasons discussed above in Section VI, Applicants submit that Notman is not properly combinable with McGinness. Thus, Notman is not properly combinable with either Mundt or McGinness, much less *both*. As a consequence, Applicants submit that claims 12-14 are in condition for allowance, which is hereby respectfully requested.

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VIII. Newly Added Claims 21-28 Are Allowable

Claims 21-28 have been added hereby to further protect the patentable subject matter of the present invention. Claims 21-²⁴ recite further novel and nonobvious limitations. Thus, claims 21-28 are further allowable over the cited art.

IX. Conclusion

It is respectfully submitted that all claims are in condition for allowance. Accordingly, prompt and favorable examination is earnestly solicited.

Respectfully Submitted,


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APPENDIX

Pursuant to 37 C.F.R. Section 1.121(c)(1)(ii), below are the changes to claim 1.

1. (amended) A process effluent abatement arrangement, comprising:
 - an enclosure which defines an interior void;
 - a first partition having a first orifice defined therein, said first partition being positioned within said interior void such that (i) said first partition divides said interior void into a first chamber and a second chamber and (ii) said first orifice is in fluid communication with said first chamber and said second chamber;
 - a gas connector which has (i) a passageway defined therethrough and (ii) a gas port in fluid communication with said passageway, said passageway (A) having an inlet and an outlet and (B) being in direct fluid communication with said first chamber of said enclosure, said gas port being downstream of said inlet and upstream of said outlet;
 - a gas dispenser in direct fluid communication with said second chamber of said enclosure; and
 - an exit port in fluid communication with said interior void.